

**COLORADO RIVER RECOVERY PROGRAM  
FY 2003-2004 PROPOSED SCOPE OF WORK for:**

Project No.: C-6 HYD

(Habitat surveys, design/engineering, construction oversight, evaluation)

**Note: Budget breakdown with labor rates attached.**

**Note: Annual reports only.**

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Date: March 14, 2003 (revised 6/2/03)

Category:

- ☐ Ongoing project  
☒ Ongoing-revised project  
☐ Requested new project  
☐ Unsolicited proposal

Expected Funding Source:

- ☐ Annual funds  
☒ Capital funds  
☐ Other

**I. Title of Proposal:**

Site surveys, floodability assessments, design and engineering, construction oversight and evaluation for habitat restoration in the Green River, Utah - Colorado River, Colorado - and Gunnison River, Colorado.

**II. Relationship to RIPRAP:**

GENERAL RECOVERY PROGRAM SUPPORT ACTION PLAN

ACTIVITY II. RESTORE HABITAT

II.A.2. Screen high-priority sites for potential restoration/acquisition.

II.A.3. Conduct NEPA for floodplain restoration program.

GREEN RIVER ACTION PLAN: MAINSTEM

ACTIVITY II. RESTORE HABITAT

II.A. Restore and manage flooded bottomland habitat.

II.A.1. Conduct site restoration.

II.A.3. Implement levee removal strategy at high-priority sites.

II.A.3.a. Preconstruction (floodability assessments, design, and engineering).

II.A.3.c. Evaluation.

COLORADO RIVER ACTION PLAN: MAINSTEM

## ACTIVITY II. RESTORE HABITAT

II.A. Restore and manage flooded bottomland habitat.

II.A.4. Implement levee removal strategy at high-priority sites.

II.A.4.a. Preconstruction (floodability assessments, design, and engineering).

II.A.4.d. Evaluation.

## COLORADO RIVER ACTION PLAN: GUNNISON RIVER

## ACTIVITY II. RESTORE HABITAT

II.A. Restore and manage flooded bottomland habitat.

II.A.2. Implement levee removal strategy at high-priority sites.

II.A.2.a. Preconstruction (floodability assessments, design, and engineering).

II.A.2.d. Evaluation.

### **III. Study Background/Rationale:**

The Habitat Restoration Program seeks to restore and/or enhance the floodability of riparian habitats to benefit endangered fishes and assist in recovery. The more practical, cost-effective, non-flow control alternatives for enhancing floodability include breaching levees, lowering floodplain elevations, and/or adjusting channel hydraulics. To increase likelihood of success and minimize potential adverse impacts, pre-construction surveys and design planning are recommended.

To date, floodability assessments and site design/engineering have been done for the U.S. Fish and Wildlife Service's Ouray National Wildlife Refuge (Johnson Bottom, Leota Bottom, Wyasket Lake, Sheppard Bottom, and Old Charley Wash); the National Park Service's Canyonlands National Park (Millard Canyon, Queen Anne Bottom, Anderson Bottom, Bonita Bend, Unknown Bottom, and Valentine Bottom)(FLO Engineering 1996); BLM wetlands (Bonanza Bridge, Horseshoe Bend, The Stirrup, Baeser Bend, and Above Brennan)(FLO Engineering 1997); and at 13 private properties along the Green River, 7 along the Colorado River, and 4 along the Gunnison River.

It is anticipated that habitat restoration for at least five sites will be performed in FY 03-04 (Thunder Ranch, Walter Walker, Audubon, Hotspot Complex and Butch Craig). In addition, a Colorado Department of Transportation site on the Colorado River near DeBeque will have the feasibility design completed. Additional hydrographic survey data to support design and planning will be collected at the sites listed above and at the Grand Junction Pipe site. Also, post-restoration monitoring is recommended at the Bonanza Bridge and Above Brennan sites on the Green River and at the Escalante State Wildlife Area on the Gunnison River.

Other considerations being addressed by this work are to help ensure that acquired and restored habitats will:

1. enhance survival, growth and recruitment of young razorback suckers and other endangered fish species as identified;
2. optimize inundation, to make the best use of existing (and anticipated future) flow regimes;
3. avoid or minimize long-term O&M;
4. avoid or minimize adverse effects on adjacent landowners; and
5. avoid or minimize adverse effects on the geomorphology of the main river channel.

#### **IV. Study Goals, Objectives, End Product:**

**Goal:**

To restore floodplain habitats in a manner that will benefit endangered fishes, minimize potential adverse effects, and be cost-effective.

**Objectives:**

1. To determine overbank flows, with and without habitat restoration;
2. To determine area of inundation as a function of flow, with and without habitat restoration;
3. To compare historical versus existing frequency, duration, and timing of flood flows, with and without habitat restoration;
4. To characterize pre-restoration baseline channel and site morphology, and post-restoration morphology;
5. To develop design options for habitat restoration.
6. To oversee habitat enhancement (i.e., construction) activities.

**End Products:**

Reports of results of each site's surveying, design and engineering activities; design drawings and construction estimates; memoranda; topographic mapping; electronic data; other hydrographic summaries as requested; and an annual report.

#### **V. Study Area**

Sites and segments will be located on the Green, Colorado, and Gunnison rivers.

## **VI. Study Methods/Approach**

To determine area of inundation versus flow relationships, surveys are conducted on candidate sites, the river channel, and water surface elevations. Analyses of these data yield topo maps, cross-sections and profiles, stage-discharge relationships, and bankful flood flow estimates for design support. USGS data are analyzed to determine flow magnitude, frequency, duration, and timing of flooding. Baseline topo maps and channel profiles also serve as a basis for post-restoration morphological comparisons.

## **VII. Task Description and Schedule**

### **Task 1. Hydrographic surveying**

#### **a. Coordinate surveying procedures**

Develop a survey plan, research control and coordinate access.

#### **b. Data collection**

Establish permanent monuments for survey control. Perform survey of main channel cross-sections and profiles, hydraulic controls, water surface elevations, site topography, top of bank and levee elevations; bathymetry; and collect stage-discharge data.

#### **c. Data reduction**

Post process, verify and summarize collected survey data.

### **Task 2. Engineering analyses**

Develop cross-sections and profiles and topographic maps. Conduct hydrologic, hydraulic, geomorphic and sediment transport analyses. Identify design alternatives and evaluate advantages/disadvantages of each. Prepare reports, memoranda and summaries. Attend meetings.

### **Task 3. Engineering design**

Prepare technical specifications, construction details, construction plans, quantity estimates, and cost estimates.

### **Task 4. Construction oversight**

Coordinate with contractor(s) for implementation and construction of restoration improvements. Perform construction stakeout, and construction monitoring.

### **Task 5. Restoration monitoring**

Evaluate design functionality; monitor post-construction topography and channel morphology. Delineate vegetation changes and quantitatively address sedimentation.

## **VIII. FY 03 Work**

### **-Deliverables**

Site reports, summaries, memoranda, design drawings, as-built drawings, electronic data, annual report.

## **X. Budget Summary**

FY 2003–2004: \$112,000 (see budget spread sheet, attached)

## **IX. References**

FLO Engineering. 1996. Green River flooded bottomlands investigation - Ouray Wildlife Refuge and Canyonlands National Park. FLO Engineering, Breckenridge, CO. 105 pp. + app.

FLO Engineering. 1997. Green River floodplain habitat restoration investigation - Bureau of Land Management sites and Ouray National Wildlife Refuge sites near Vernal, Utah - Final Report. FLO Engineering, Breckenridge, CO. 63 pp. + app.

FLO Engineering. 1999. Floodability assessments of private land sites along the Green River, Gunnison River and Colorado River. Draft 1998 floodplain habitat restoration status report, Volume IA. FLO Engineering, Breckenridge, CO. Six sections + app.

FLO Engineering. 1999. Post-restoration sedimentation and erosion monitoring/evaluation for Green River floodplain habitat restoration sites, near Vernal, Utah. Draft 1998 floodplain habitat restoration status report, Volume IIA. FLO Engineering, Breckenridge, CO. Five sections + app.